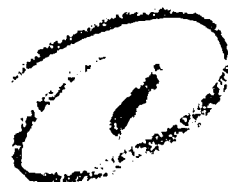


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U. S. Army Chemical Corps Research and Development Command
U. S. ARMY BIOLOGICAL WARFARE LABORATORIES
Fort Detrick, Frederick, Maryland

A device for air sampling.

by A. I. Vasil'yev, Captain, Med. Service

Translated from Voenno-Meditsinskiy Zhurnal. 3: 81-82, 1957

In our daily practical work the collection of air samples is difficult, particularly under field conditions, because the apparatus we have for this purpose is not suitable for field work. The samplers known to us are powered by electric current, however, we are nevertheless often required to take air samples where, as a rule, there is no electricity.

We have constructed a special device that permits air sampling for bacteriological analysis in any, including field, conditions (see illustration). The device is comprised of three parts: a housing, a fan, and a base. The housing is shaped like a hollow truncated cone with its base turned upwards. The size of the cone's base can be arbitrary, but its lower end must equal 8.5 cm in diameter (due to the fact that a Petri dish's diameter is 10 cm). Within the hollow cone, near its base, a four-bladed fan with transmission mechanism is mounted on two horizontal rods. The fan is attached to a vertical shaft, on the lower end of which is a gear. The latter is meshed with a vertical gear that is attached to a shaft having a drive gear on the outside of the cone. The inner gears and also the vertical, and a portion of the horizontal, shafts are mounted in a special iron case, which is held by iron rods soldered to the cone's inner surface. This case (not shown in the illustration) makes it possible to firmly secure all shafts and gears, and fasten them to the cone. Along the cone's exterior surface is a larger gear with a handle. This gear is 6 times larger than the external gear with which it is meshed. The shafts of these two gears are secured through a plate located along the cone's exterior, and below the cone's upper edge. To the three legs that support the cone is attached the base with a small table, on which a Petri, or Koch, dish is placed. The table can be lowered or raised by means of a screw running through the base.

In moving the large gear we set the fan in motion via the transfer mechanism and thereby create an air stream travelling from the cone's base towards the tip, beneath which, on the table, is the Petri dish containing a nutrient medium. The air stream, striking against the nutrient medium, inoculates it with the germs from the air.

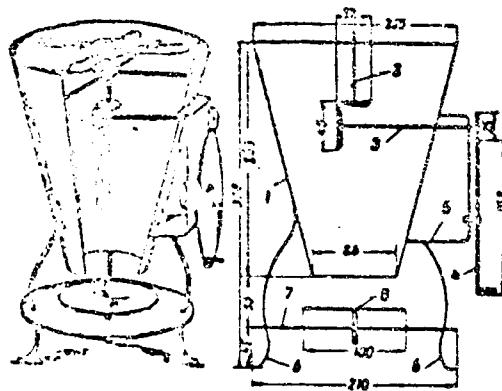
Thus, in passing the air through the device's housing, it is possible to entrap the majority of microorganisms. When suitable solid media are unavailable, or the microflora in the air is retained poorly by the dishes

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placed under the housing, it is possible to inoculate onto liquid nutrient media, or pass the air through water. In the latter event water is poured into a Koch dish containing smalls, and the lower part of the cone is placed into the water. With the air's passage through the water the microflora are entrapped, and afterwards the water is inoculated onto special media. If the air is passed through a liquid nutrient medium, then the latter can be placed directly into the thermostat.

Illustration



1 — корпус прибора; 2 — ось вентилятора с шестерней; 3 — ось с внутренней и наружной шестернями; 4 — большая шестерня с ручкой; 5 — листовое железо для крепления осей наружных шестерен; 6 — ножка треношника; 7 — подставка для столика; 8 — столик с винтом.

- 1 - housing; 2 - fan shaft w/gear; 3 - shaft w/internal and external gears;
- 4 - large gear w/handle; 5 - sheet iron for securing the external gear shafts;
- 6 - tripodal legs; 7 - base for the table; 8 - table w/screw.